

WHAT WE CLAIM IS:

1. A reaction process,

characterised by the step of

introducing reaction components to a medium,

wherein at least one of the reaction components has a different flow rate from the other reaction component(s) through the medium, so that a moving reaction phase is formed which causes reaction products.
2. A reaction process as claimed in claim 1

characterised by the further step of

separating the reaction products from the medium.
3. A reaction process as claimed in claim 1 or claim 2 wherein the differences in flow rate through the medium are a consequence of the molecular size of at least one reaction component.
4. A reaction process as claimed in claim 1 or claim 2 wherein the differences in flow rate through the medium are due to electrostatic charge.
5. A reaction process as claimed in claim 1 or claim 2 wherein the differences in flow rate through the medium are due to ligand interaction.
6. A reaction process as claimed in any one of claims 1 to 5 wherein the properties of the medium that provide differing flow rates to the reaction components also leads to separation of the reaction products.

7. A reaction process as claimed in any one of claims 1 to 6 wherein the medium includes porous beads.
8. A reaction process as claimed in claim 7 wherein the beads are made of a crossed linked polymeric material.
9. A reaction process as claimed in claim 8 wherein the crossed linked polymeric material includes dextran.
10. A reaction process as claimed in claim 8 wherein the crossed linked polymeric material includes agarose.
11. A reaction process as claimed in any one of claims 1 to 10 wherein the moving reaction phase is controlled by altering the properties of the medium.
12. A reaction process as claimed in any one of claims 1 to 10 wherein the moving reaction phase is controlled by altering the volumes of the reaction components through the column.
13. A reaction process as claimed in any one of claims 1 to 10 wherein the moving reaction phase is controlled by altering the overall flow rate through the column.
14. A reaction process as claimed in any one of claims 1 to 13 wherein the reaction products are selectively removed from the reaction zone, preventing them from being involved in subsequent reactions.
15. A reaction process as claimed in claim 14 wherein the reaction products are selectively removed from the reaction zone due to differences in molecular size between the reaction components and the reaction products.
16. A reaction process as claimed in any one of claims 1 to 15 wherein the

properties of the medium are selected to substantially prevent particular reaction products from forming.

17. A reaction process as claimed in any one of claims 1 to 16 wherein the properties of the medium are selected to orient the reaction components to provide selectivity of an active site in reactions where multiple active sites exist.
18. A reaction process as claimed in any one of claims 1 to 17 wherein an active site is protected through the use of protection chemistry to selectively produce a particular reaction product.
19. A reaction process as claimed in any one of claims 1 to 18 wherein the reaction process is used for glycosylation reactions.
20. A reaction process as claimed in any one of claims 1 to 18 wherein the reaction process is used for polymerisation.
21. A reaction process as claimed in any one of claims 1 to 18 wherein the reaction process is used for cleavage reactions.
22. A reaction process as claimed in any one of claims 1 to 18 wherein the reaction process is used for protein PEGylation.
23. A reaction process as claimed in any one of claims 1 to 22 wherein the reaction process is controlled using size-exclusion reaction chromatology.
24. A method of protein PEGylation,

characterised by the step of

forming a moving reaction phase using a reaction process as claimed in any one of claims 1 to 18.

25. Reaction products produced by the reaction process of any one of claims 1 to 23.
26. Reaction products as claimed in claim 25 wherein the products are PEGylated protein.
27. Use, in the manufacture of a pharmaceutical composition, of reaction products produced by the reaction process of any one of claims 1 to 23.
28. A kitset to bring two or more reaction components together, including at least two reaction components, a medium, characterised in that at least one of the reaction components has a different flow rate from the other reaction component(s) through the medium, so that a moving reaction phase is formed, which produces reaction products.
29. A kitset for use in a reaction process as claimed in any one of claims 1 to 23, including unit volumes of at least two reaction components, a medium, instructions and means for bringing two or more reaction components together in a moving reaction phase.
30. A reaction process of bringing two or more reaction components together substantially as described herein with reference to and as illustrated by the accompanying examples and figures.

31. . Reaction products substantially as described herein with reference to and as illustrated by the accompanying examples and figures.
32. A kitset substantially as described herein with reference to and as illustrated by the accompanying examples and figures.